AMENDMENTS TO THE CLAIMS

The claim listing below shall replace all prior claim listings in this application.

1. **(Canceled)**

2. **(Withdrawn; Currently Amended)** The method of claim 34, wherein said Purkinje neuron deficiency arises from a disorder selected from the group consisting of abnormalities of the central autonomic systems, congenital disorders and disorders arising from teratogen exposure, demyelinating diseases, diseases of peripheral nerves, disorders of the hypothalamus and pituitary, disorders of movement, disorders of the spinal cord and vertebral column, epilepsy, hypoxia, increased intracranial pressure, infectious disease, neoplasia, neurodegenerative disorders, neuronal disorders associated with aging and senile dementia, nutritional disorders, perinatal neuropathologies, radiation damage, schizophrenia, single gene disorders, toxic disorders, trauma, vascular disease, and psychiatric disorders other than schizophrenia.

3. **(Withdrawn; Currently Amended)** The method of claim 2, wherein said Purkinje neuron deficiency is not a Purkinje neuron deficiency arising from a disorder selected from the group consisting of: a lysosomal or peroxisomal disorder, Zellweger's disease, human immunodeficiency virus (HIV) infection, multiple sclerosis (MS), adrenoleucodystrophy, adrenomyeloneuropathy, a metachromatic leucodystrophy, a sulphatide lipidosis, globoid cell leucodystrophy, amyotrophic lateral sclerosis, amyotrophic lateral sclerosis with frontal lobe dementia, a bone marrow ablation treatment, lymphoreticular disorders, metastases of tumors which do not arise in the nervous system, infantile acid maltase deficiency (Pompe's disease), Ceroid lipofuscinosis, a deficiency of GM2 gangliosidase, Sanfilippo's disease, leucodystrophy, systemic lupus erythematosus, thrombophilia associated with antiphospholipid antibodies or polycythemia, and anemia including Sickle cell disease, beta-thalassemia major, and other thalassemias.

4-7. **(Canceled)**

8. **(Previously Presented)** The method of claim 34, wherein said agent is administered in conjunction with a neuronal factor.

9. **(Previously Presented)** The method of claim 8, wherein said neuronal factor is selected from the group consisting of: nerve growth factor (NGF), brain-derived neurotrophic factor (BDNF), neurotrophin-3, -4, -5, -4/5 and -6 (NT-3, -4, -5, -4/5, -6), ciliary neurotrophic factor (CNTF), glial-derived neurotrophic factor (GDNF), growth promoting activity (GPA), luteinizing hormone releasing hormone (LHRH), KAL gene, insulin, insulin-like growth factor-I-alpha, I-beta, and -II (IGF-I-alpha, I-beta, -II), interleukins, platelet derived growth factors retinoic acid fibroblast growth factors (FGFs, epidermal growth factor (EGF), leukemia inhibitory factor (LIF), the neuropeptide CGRP, vasoactive intestinal peptide (VIP), gliobastoma-derived T cell suppressor factor (GTSF), transforming growth factor alpha, epidermal growth factor, transforming growth factor betas, vascular endothelial growth factors stem cell factor (SCF), neuregulins and neuregulin family members, netrins, galanin, substance P, tyrosine, somatostatin, enkephalin, ephrins, bone morphogenetic protein (BMP) family members semiphorins, glucocorticoids, progesterone, putrescine, supplemental serum, extracellular matrix factors, cellular adhesion molecules, and neuronal receptor ligands.

10. **(Previously Presented)** The method of claim 8, wherein said neuronal factor is administered with the agent that mobilizes bone marrow cells.

11. **(Previously Presented)** The method of claim 8, wherein said neuronal factor is administered separately from said agent that mobilizes bone marrow cells.

12. **(Original)** The method of claim 11, wherein said neuronal factor is administered intrathecally.

13. **(Previously Presented)** The method of claim 34, further comprising the step of mildly damaging the nervous system of the individual.

14-18. **(Canceled)**

19. **(Previously Presented)** The method of claim 34, wherein said agent that mobilizes bone marrow cells is administered by direct administration into a site in said individual's nervous system.

20. **(Previously Presented)** The method of claim 19, wherein said site in the individual's nervous system is in the individual's central nervous system (CNS).

21. **(Previously Presented)** The method of claim 34, wherein said individual is a human.

22-33. **(Canceled)**

34. **(Currently Amended)** A method for producing a Purkinje/bone marrow-derived heterokaryon, comprising: administering an agent that mobilizes bone marrow cells to an individual having a ~~disorder caused by a~~ deficiency of Purkinje neurons, wherein the agent induces mobilization of bone marrow cells which results in the formation of the Purkinje/bone marrow-derived heterokaryon in the nervous system of the individual, wherein said Purkinje neuron deficiency is not a neuron deficiency arising from a lysosomal or peroxisomal disorder.

35-38. **(Canceled)**

39. **(Previously Presented)** The method of claim 34, wherein the Purkinje/bone marrow-derived heterokaryon is derived by fusion of a bone marrow-derived cell with a Purkinje neuron.

40. **(Canceled)**

41. **(Previously Presented)** The method of claim 39, wherein the fusion of the bone marrow-derived cell with the Purkinje neuron results in the activation of Purkinje neuron-specific gene expression.

42. **(Previously Presented)** The method of claim 41, wherein the Purkinje/bone marrow-derived heterokaryon does not express a hematopoietic marker protein selected from the group consisting of CD45, CD11b, F4/80, and Iba1 at a time greater than three months post-heterokaryon formation.

43. **(Previously Presented)** The method of claim 34, wherein the Purkinje/bone marrow-derived heterokaryon exhibits the morphology of a functioning Purkinje neuron.

44. **(Previously Presented)** The method of claim 34, wherein the Purkinje/bone marrow-derived heterokaryon does not express a hematopoietic marker selected from the group consisting of CD45, CD11b, F4/80, and Iba1.

45. **(Previously Presented)** The method of claim 34, wherein the agent is G-CSF.

46. **(Withdrawn)** The method of claim 34, wherein the agent is GM-CSF.

47. **(Withdrawn)** The method of claim 34, wherein the agent is Flt-3 ligand.

48. **(Withdrawn)** The method of claim 34, wherein the agent is MIP.alpha.

49. **(Withdrawn)** The method of claim 34, wherein the agent is an anti-VLA-4 antibody.

50. **(Withdrawn)** The method of claim 34, wherein the agent is an anti-VCAM-1 antibody.